

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**WETLAND RESTORATION  
(acre)  
Code 657**

**DEFINITION**

A rehabilitation of a drained or degraded wetland where the soils, hydrology, vegetative community, and biological habitat are returned to the natural condition to the extent practicable.

**PURPOSE**

To restore hydric soil conditions, hydrologic conditions, hydrophytic plant communities, and wetland functions that occurred on the disturbed wetland site prior to modification to the extent practicable.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies only to sites with hydric soils which were natural wetlands that have been previously degraded hydrologically and/or vegetatively.

This practice is applicable only if natural hydrologic conditions can be approximated by modifying drainage and/or artificial flooding of a duration and frequency similar to natural conditions.

This practice does not apply to: a Constructed Wetland (656) intended to treat point and non-point sources of water pollution; Wetland Enhancement (659) intended to rehabilitate a degraded wetland where specific functions and/or values are enhanced beyond original conditions; or Wetland Creation (658) for creating a wetland on a site location which historically was not a wetland or was formerly a wetland but will be replaced with a wetland type not naturally occurring on the site.

**CRITERIA**

**General Criteria**

- Complete the Wetland Planning Checklist, Appendix A, of chapter 13 , Engineering Field Handbook.
- Upon completion of the restoration the site will meet the current NRCS soil, hydrology, and vegetation criteria of a wetland.
- The landowner shall obtain necessary local, state, and federal permits that apply before restoration.
- Water rights including flowage easements are assured prior to restoration if required.
- Establishing vegetative buffers on surrounding uplands to reduce the movement of sediment and soluble and sediment-attached substances carried by runoff.
- The soil, hydrology and vegetative characteristics existing on the site and the contributing watershed shall be documented before restoration of the site .
- If the presence of hazardous waste materials in the sediment or fill is suspected, soil samples will be collected and analyzed for the presence of hazardous waste as defined by local, state, or federal authorities. Sites containing hazardous waste will not be restored under this standard.

**Criteria for Hydric Soil Conditions**

- Restoration sites will be located on hydric soils.
- If the hydric soil is covered by fill, sediment, spoil, or other depositional material, the

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Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

material covering the hydric soil shall be removed only to the surface of the buried (or original) hydric soil. Sediments shall be spread on adjacent upland sites according to the practice standard Soil Spreading (572), or removed to a safe disposal area.

- Reestablish an approximation of the original soil microtopography.

### **Criteria for Hydrology Restoration**

- A permanent water supply should be available approximating the needs of the wetlands. The hydrology of the site is defined as the rate, path, and timing of inflow and outflow, duration, frequency, and depth of flooding, ponding or saturation.
- The maximum hydrology and the overall hydraulic variability of the restored site will approximate the conditions that existed before alteration, e.g., dynamic and static water levels, soil saturation.
- Existing drainage systems will be utilized, removed, or modified as needed to achieve the intended purpose as follows:

#### **1. EMBANKMENTS AND WATER CONTROL STRUCTURES**

The practice standards for Dike (356), Pond (378) and Structure for Water Control (587) will be used as appropriate. Refer to the Engineering Field Handbook, Chapter 13, "Wetland Restoration, Enhancement, and Creation," and Chapter 6, "Structures," for additional design information.

#### **2. OPEN DITCHES**

In non-depressional wetlands, the length of open ditch shall be filled as a minimum to the natural ground elevation.

In depressional wetlands, a ditch plug may be used. Provisions shall be made to store, pass through or divert excessive runoff.

Ditch plugs shall be designed according to practice standard Structure for Water Control (587).

#### **3. SUBSURFACE DRAIN PLUG**

Subsurface drains shall be plugged downstream of the restoration for a minimum of 50 feet in clay or clay loam soils and 150 feet in sandy or organic soils.

All envelope, filter material or flow enhancing material shall be removed.

The trench shall be filled with similar wetland soil and compacted to achieve the density equivalent to adjacent existing material.

Subsurface drain plugs shall be designed according to practice standard Structure for Water Control (587).

### **Criteria for Vegetation Restoration**

- The vegetation shall be restored as close to the original natural plant community as the restored site conditions will allow.
- Determination of the original plant community's species and percent composition shall be based upon reference wetlands of the type being restored or suitable technical reference.
- Plantings, seeding, or other types of vegetative establishment will be comprised of native species that occur on the wetland type being restored.
- Preference shall be given to native wetland plants with localized genetic material. Plant materials collected or grown from material collected within a 200 mile radius from the site is considered local.
- In soils where seed banks realistically exist, or where natural colonization of selected native species (identified from reference wetlands) will dominate within 5 years, then natural regeneration can be allowed.
- Adequate substrate material and site preparation necessary for proper establishment of the selected plant species shall be included in the design.
- On sites which were predominantly herbaceous vegetation prior to modification and planting and/or seeding is necessary, the minimum number of native species to be established shall

be based upon the number of ecological sites present. Sites restored to only one ecological site shall be established with at least two species adapted to the site. Sites with two or more ecological sites (i.e., wet meadow, shallow marsh, or deep marsh etc.) shall be established with at least one native species on each ecological site.

- Herbaceous vegetation may be established by a variety of methods including: mechanical or aerial seeding, topsoiling, organic mat placement, wetland sod, vegetative sprigs, wetland hay, etc., over the entire site or a portion of the site and at densities and depths appropriate.
- Forested wetland plantings and/or seeding will include a minimum of three tree or shrub species on each ecological site (i.e., scrub/shrub, bottomland hardwood, etc.), where appropriate. Tree (and shrub) planting will follow the criteria of practice standard Tree Planting (612).
- Seed planting rates and site preparation will meet the criteria of practice standard Woodland Direct Seeding (652). Seed viability will be determined prior to planting.

### **Criteria for Wetland Functions**

A functional assessment (Hydrogeomorphic Approach or similar method) shall be performed on the site prior to restoration.

Restoration goals and objectives shall include targeted natural wetland functions for the wetland type and the site location as determined by the functional assessment and reference site data. A post-project assessment will be performed after an adequate period to assess the success of the restoration.

### **CONSIDERATIONS**

- Consider effect of volumes and rates of runoff, infiltration, evaporation, and transpiration on the water budget.
- Evaluate the potential for a change in rates of plant growth and transpiration because of changes in the volume of available soil water.

- Consider effects on downstream flows or aquifers that would affect other water uses or users.
- Consider effects on wetlands or water-related resources wildlife habitats, including threatened, endangered and special concern species that would be associated with the practice. Refer to Section I of the FOTG for county specific data.
- Consider as a high priority those sites adjacent to existing wetlands as they increase wetland system complexity and diversity, decrease habitat fragmentation, and ensure colonization of the site by wetland flora and fauna.
- Consider linking wetlands by corridors wherever appropriate to enhance the wetland's use and colonization by the flora and fauna.
- Consider the effects of varying water levels in response to potential climatic events such as wet or dry periods.
- The nutrient and pesticide tolerance of the plant species planned should be considered where known nutrient and pesticide contamination exists.
- Consider effects of temperature on water resources to prevent undesired effects on aquatic and wildlife communities. Consult with the MDNR Area Fisheries Manager when planning a project near a cold water stream.
- For discharge wetlands, consider upslope water/groundwater source availability.
- Consider the effects of short term changes, construction and maintenance activities.

### **PLANS AND SPECIFICATIONS**

Specifications for this practice shall be prepared for each site. Specifications shall be recorded using approved specifications sheets, job sheets, narrative statements in the conservation plan, or other documentation.

Requirements for the operation and maintenance of the practice shall be incorporated into site specifications.

## **OPERATION AND MAINTENANCE**

The following actions shall be carried out to insure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance):

Any use of fertilizers, mechanical treatments, prescribed burning, pesticides and other chemicals to assure the wetland restoration function shall not compromise the intended purpose;

Biological control of undesirable plant species and pests (e.g., using predator or parasitic species) shall be implemented where available and feasible;

Timing and level setting of water control structures required for the establishment of desired hydrologic conditions or for management of vegetation;

Inspection schedule for embankments and structures for damage assessment;

Depth of sediment accumulation to be allowed before removal is required;

Haying and livestock grazing plans will be developed so as to allow the establishment, development, and management of wetland and associated upland vegetation.